

Case Study: Amherst

NITROGEN REMOVAL AMHERST, MASSACHUSETTS (POPULATION 38,000)

Compliance with Nitrogen limits without Facility Upgrade

Cost: \$100,000

Annual Savings: \$30,000/yr in lower sludge disposal expenses



A 2008 BioWin modeling study concluded “the existing facility has half of the necessary volume at the current flows... to consistently achieve [8 mg/L effluent] nitrogen...” A \$61 million dollar facility upgrade to Amherst’s 7.2 MGD mechanical aeration facility was found necessary.

Instead, Amherst staff, working with CleanWaterOps, established a lower F:M ratio and now operates the plug-flow aeration tanks in a combination MLE/SBR mode. In each treatment train the first aeration cell remains anoxic while the second aeration cell cycles between aerobic and anoxic conditions. New in-line ORP and DO instruments dedicated to each Aerator and the plant’s SCADA system individually controls the speed of each mechanical aerator.

Amherst’s wastewater is low in pH and does not contain sufficient alkalinity to support full nitrification without chemical addition. Until more stringent limits are established, Amherst is able to meet their total-nitrogen limit by optimizing nitrate removal while carefully controlling ammonia removal to limit nitrite production.

The higher sludge age has resulted in less waste sludge being produced. Amherst is realizing better treatment more sustainably at lower sludge disposal costs.

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